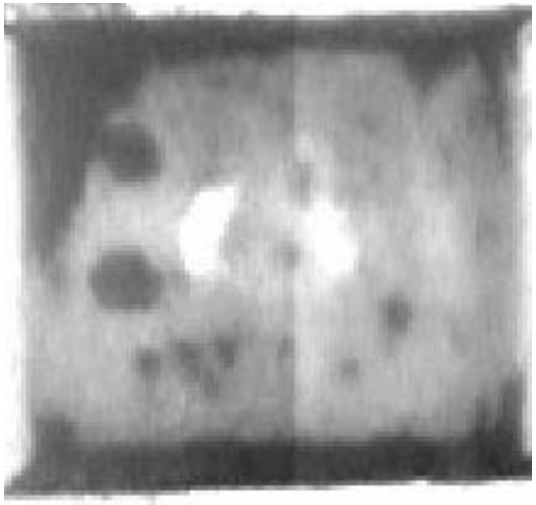
Formation of High Temperature Superconducting Balls
Rongjia Tao, Temple University, DMR-0075780

The interaction between superconductors and electric field is of fundamental importance.
Recently we conducted experiments with high temperature superconducting particles (μm size) in a low frequency ac field. If the electric field is weak, the particles form chains along the field direction (Fig. a). If the field is strong, the chains break and the particles form balls (Fig.b).A new theory has proposed to explain the discovery.
Phys. Rev. B **68,** 144505 (2003).

(a)



(b)

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Education:
One undergraduate (Stephen Murray), one graduate student (Eyas Amr), and one postdoctoral fellow (Xiaojun Xu) contributed to this work.

Undergraduate Stephen Murray received his B.S. from Temple University in 2003 and is entering the Law School of Temple University to become a Patent Lawyer.

Eyas Amr is at the final stage to complete his dissertation. He plans to receive his Ph.D. in Physics either in December 2003 or May 2004. Many institutions show interest in his work.

Outreach:
Bridgestone Company is interested in this research project. At its invitation, the PI becomes a scientific consultant for Bridgestone Company and visited the Company's US division in Ohio in June 2003 to discuss possible industrial applications of the discovery.

The engineers of Bridgestone Company also visited the PI at Temple University twice, in November 2002 and September 2003, to see the demonstration of discovery. Two parties will continue to discuss possible industrial applications of the discovery.